Space Weather Forecast

Issued on Wednesday, 15 February 2023 at 00:49 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Further isolated M-flares (R1/R2 Radio Blackouts) likely, with a slight chance of isolated X-flares (R3 Radio Blackout).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was Moderate during the period, with two low-level Moderate-class flares. One originating from the largest and most magnetically complex region in the northeast of the visible disc, and the other from a former large region transiting over the northwest limb at present. There are currently 12 sunspot regions on the visible disc, with the other regions either small and magnetically simple or relatively stable.

No Earth-directed Coronal Mass Ejections (CMEs) have been observed in available imagery during the last 24 hours.

Solar Wind / Geomagnetic Activity: There was an outage of solar wind data until 13/1254 UTC. However, weak CME interaction was likely to have continued into the overnight (UTC) period 13th/14th, with possible further weak CME interaction looking likely to have occurred over the past couple of hours. Solar wind speeds were at ambient levels prior to, and after the data gap, varying between 320-400 km/s. The total Interplanetary Magnetic Field was weak but jumped slightly with suspected weak CME arrivals. The north-south component varied weakly. Geomagnetic activity was Quiet (Kp 1-2).

Energetic Particles / Solar Radiation: The count rate of energetic particles was at background levels with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is likely to be Moderate, with a slight chance of becoming High with any Strong flares.

Solar Wind / Geomagnetic Activity: Earth has experienced weak CME effects recently. There are no significant coronal holes in the forecast at present, so the solar wind speed is considered most likely to remain at ambient levels. However, there is the possibility of slightly faster solar winds at times between Days 2 and 4, but this aspect is low confidence.

Geomagnetic activity is expected to be Quiet to Unsettled, perhaps with a low chance of rising to isolated Active between Days 2 and 4 should we observe any slightly faster solar winds.

Energetic Particles / Solar Radiation: The count rate of energetic particles is expected to remain at background levels, but there is a slight chance of exceeding the S1/Minor radiation storm level in response to any significant flares that occur.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	5	5	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	50	50	40	40
Very Active	R3 to R5 X	No	10	10	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	15	10	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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